EVALUATION OF THE SIB2 SURFACE SCHEME IN A SEMI-ARID REGION

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1. **ABSTRACT**

Soil-Vegetation-Atmosphere Transfer (SVAT) schemes vary in complexity. For the purpose of using remotely sensed data to document surface energy exchanges, we wish to select a SVAT which is not only adequately realistic and calibrated for semi-arid conditions but which also can benefit from near real-time assimilation of remotely-sensed data. Version 2 of the Simple Biosphere model (SiB2) is one of the more complete SVAT schemes currently available and it was specifically designed to accept vegetation parameters diagnosed from optical remotely sensed data. Because the thermal contrast between bare soil and vegetation can be large in semi-arid regions, we are evaluating a mosaic, two-component version of SiB2 in the RAMS mesoscale model to make the required diagnosis of surface energy and water exchanges. We find that several parameters in SiB2, especially the upper temperature cutoff for photosynthesis, need to be calibrated for semi-arid regions.

In due course the SiB2-RAMS coupled model will be run in real time over the whole San Pedro Basin on a 4 kilometer grid. So far the model has been hand calibrated to match observed fluxes and surface resistances. The parameters pertinent to this calibration are stomatal conductance slope parameter and bulk canopy boundary layer resistance coefficient. The modeled fluxes and evolution of those fluxes have been found to be highly dependent on initial soil moisture distribution within the watershed. This implies that a reliable remotely sensed soil moisture product would greatly enhance the performance and calibration of this model.

2. **ACKNOWLEDGMENT**

3. **REFERENCES**

Sellers, P. J., D. A. Randall, G. J. Collatz, J. A. Berry, C. B. Field, D. A. Dazlich, C. Zhang, G.. D. Collello and L. Bounoua, 1996: A revised land surface parameterization (SiB2) for atmospheric GCMs. Part I: Model Formulation. *J. Climate*, **9**, 676-705.

Sellers, P. J., S. O. Los, C. J. Tucker, C. O. Justice, D. A. Dazlich, G. J. Collatz and D. A. Randall, 1996: A revised land surface parameterization (SiB2) for atmospheric GCMs. Part II: The generation of global fields of terrestrial biophysical parameters from satellite data. *J. Climate*, **9**, 706-737.

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